

# Autogenous tooth transplantation – two clinical cases

*\*Sunil Kumar C \*\*Mohan B and \*\*\*Lakshminarayanan L*

## ABSTRACT

(Autotransplantation can be employed as an alternate, innovative treatment option for correction of malposed teeth. This paper highlights the procedure of autotransplantation with two case reports. Post operative follow up in both the cases were uneventful with radiographic evidence of good bone healing and maintenance of the periodontal ligament space. Clinically the teeth were well stabilized without any pocket formation. The simplicity and reliability of the procedure has made autotransplantation a viable and often preferred treatment option over orthodontic and prosthodontic methods of correction of malposed teeth.)

Key words — Autotransplantation, malposed teeth

## Introduction

While dental caries has been regarded as the major dental disease throughout the world, malocclusion is a close runner up. The morphogenetic nature of most malocclusions assures us that this dentofacial problem will continue to demand the best that dentistry can offer for a long time indeed.<sup>1</sup>

Single tooth malposition has been a problem since antiquity<sup>2</sup>, and attempts to correct this disorder go as far back as 1000 BC. Orthodontic space closure and prosthetic replacement are two possible approaches to solve this problem, but these can result in a compromise of esthetics, symmetry, occlusal function, or periodontal stability.

This article is intended to provide a review on "State of the Art" of yet another approach, namely autogenous tooth transplantation in combination with endodontic therapy. This procedure has improved to the point where it might be considered as part of treatment procedures. A careful review of the literature bears out many differences in techniques, as well as in success rates. Special efforts have been taken to minimize complications and provide a realistic, modern methodology for a better prognosis.

Transplantation is the transfer of tissue or an organ from one site to another. Autogenic or autoplasmic transplantation means that the donor and the recipient are the same individual.

Many of the indications and contra indications are quite obvious, but attention must be paid to every aspect of the procedure to enhance an optimal result.<sup>3</sup>

Autotransplantation combined with endodontic therapy in the treatment of

\* Post Graduate Student

\*\* Lecturer

\*\*\* Professor and Head

Department of Conservative Dentistry & Endodontics  
Saveetha Dental College and Hospital  
Chennai-600 077.

premolar malocclusion opens up new avenues of treatment. A pre requisite for the use of this method, however is a thorough knowledge of the expected long term success rate. If used with care, this method will supplement and enhance the treatment modality.<sup>4</sup>

Here are two case reports wherein, a combination of autotransplantation and endodontic therapy was performed to correct premolar malocclusion.

### Case Report - 1

A 28 year old man reported to the Department of Conservative dentistry and Endodontics, with the chief complaint of food lodgement in the lower right posterior region.

Clinical examination revealed the premolar malocclusion i.e. crowding of 1<sup>st</sup> and 2<sup>nd</sup> premolar and food impaction between them. Intra-oral periapical radiograph showed complete overlap of crowns of 1<sup>st</sup> and 2<sup>nd</sup> premolars. (Fig. 1) The first premolar was carious and badly mutilated.

Various treatment options were explained to the patient.

The options given were,

1. Extraction of first premolar followed by orthodontic movement of second premolar to proper position.
2. Extraction of both premolars followed by

prosthetic replacement.

3. Extraction of first premolar followed by autotransplantation of second premolar.

The patient refused orthodontic treatment and extraction. Therefore, the next viable treatment option, autotransplantation was carried out after taking patients consent.

### Treatment Procedure

A preoperative impression of the lower arch was made and a plaster cast was obtained (Fig.2) on to which a custom fabricated splint was made with 19 gauge stainless steel wire.

Inferior alveolar nerve block was given on the right side with 2% Lignocaine HCl. The carious 1<sup>st</sup> premolar was extracted. The socket area on the residual alveolar ridge (recipient site) was modified with water cooled tungsten carbide bur using slow speed. The recipient site was covered with wet gauze. Buccally placed 1<sup>st</sup> premolar was carefully extracted to prevent any damage to the periodontal ligament. (Fig. 3)

Care was taken to handle the tooth with its crown. Endodontic therapy was performed immediately after extraction. Apicectomy was done and IRM was used as a retrofilling material. The whole procedure was completed within 15 minutes. The tooth was now transferred to the modified recipient site and

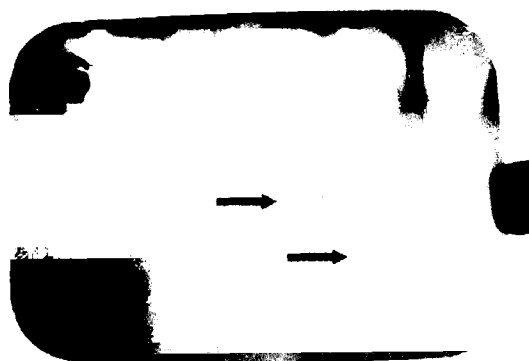


Fig. 1 Case1 : Pre-operative radiograph



Fig. 2 Cast made from pre-operative impression



Fig. 3 Picture showing the extraction sockets of both the premolars

was checked for occlusion. It was stabilized in its new position with custom fabricated splint and light cured composite resin. Occlusion was rechecked and sutures were placed to approximate the extraction socket of IInd premolar and the patient was recalled after 1 week for removal of sutures. Fig.4 shows the occlusal view of the transplanted tooth in its new position. At one year follow-up, the tooth was found to be firm without any symptoms. The gingival health around the tooth was satisfactory with no evidence of any pocket formation. The intra-oral radiograph showed satisfactory bony architecture around the tooth and normal peri-apical area with no sign of resorption of either the bone or the root. (Fig 5)

## Case Report 2

A 24 year old lady reported to the department of Conservative Dentistry and Endodontics with the chief complaint of malpositioned tooth in upper left posterior region.

Clinical examination revealed retained deciduous IInd molar and palatally erupted IInd premolar.(Fig. 6) Intra-oral radiograph showed partially resorbed roots of deciduous molar and the position and incline of the root of the IInd premolar (Fig. 7)

The same treatment procedure as in the previous case was performed. The over-



Fig. 4 Post-operative photograph - Occlusal view

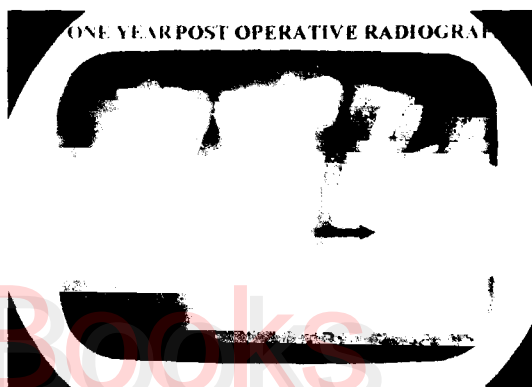


Fig. 5 One year follow up radiograph

retained deciduous molar and the IInd permanent premolar were extracted (Fig. 8). Endodontic treatment with retrograde sealing was performed in the premolar and it was transplanted in the modified socket of deciduous molar and splinted with adjacent teeth (Fig. 9)

Follow-up at one year in this case was also very satisfactory both clinically and radiographically. The tooth was firm and well encapsulated by healthy bone, both at crestal height and in the periapical region. (Fig. 10)

## Discussion

A successful autotransplantation could be defined as a tooth with absence of periodontal inflammatory changes as well as progressive root resorption and the development of sound



Fig. 6 Case 2: Pre-operative photograph - Palatal view

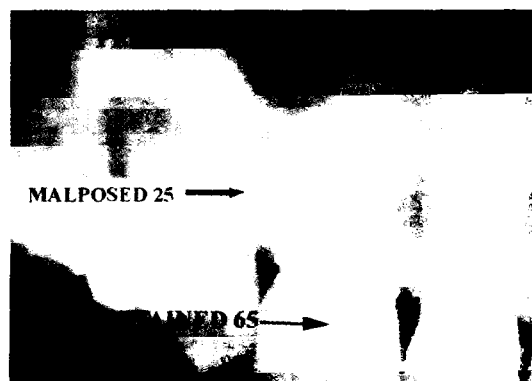


Fig. 7 Pre-operative radiograph



Fig. 8 Picture showing the sockets of extracted deciduous second molar and palatally erupted second premolar



Fig. 9 Post-operative photograph

periodontium to support the continued function of the tooth.<sup>5</sup> The biological course of autotransplanted teeth is influenced by a number of conditions, which are recognized as prognostic factors. For example, the age of the patient, the developmental stage of the tooth, the type of tooth transplanted, surgical trauma and the extra oral handling of the tooth are assumed to have a profound influence on the retention or loss of the tooth.<sup>6-12</sup>

Autotransplantation in combination with endodontic therapy has become a reliable treatment option in the treatment of certain malocclusion cases. This treatment modality was selected in the above two cases owing to the patients' choice within the given options.

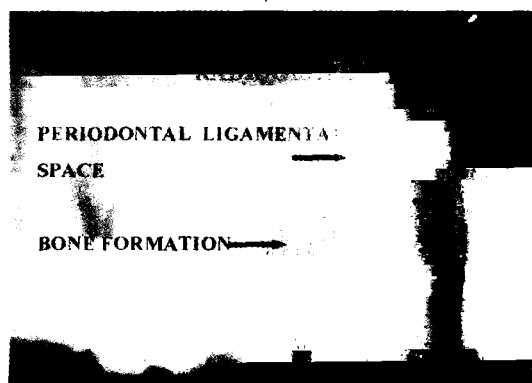


Fig. 10 One year follow up radiograph

The basic advantage of this treatment is, it is less time consuming as compared to orthodontic treatment and economical

compared to fixed prosthetic replacement. Moreover, the patients' acceptance is high, as it retains the natural tooth and treatment is completed in a single visit followed by two or three follow up visits.

Autotransplantation which provides the possibility for a natural tooth rather than a prosthesis or an osseointegrated implant to correct a malocclusion is a unique treatment modality for young patients.<sup>4</sup> In properly selected cases the need for prosthesis can be eliminated, orthodontic treatment can usually be avoided, alleviating many of the anticipated side effects such as deepened bites, flattened facial profiles, relapse etc. and maximal conservation of tooth<sup>3</sup>.

Few clinical tips for successful autotransplantation are :

1. Cases must be selected carefully. The patients ability to comprehend and co-operate is critical.
2. The recipient site must be healthy and of adequate size to receive the transplant. It is important that the recipient site be prepared before the transplant is made available.
3. Tremendous care must be exercised not to insult the root surface. The tooth to be transplanted should be handled only by its crown.
4. The length of time from removal to reinsertion should be minimal, ideally this is a non stop relocation. Dessication of the periodontal ligament can cause resorption, ankylosis and failure.
5. Careful surgical technique and management of soft tissues cannot be over emphasized.
6. Soft tissue reproximation and ligation with silk sutures, combined with great care on the part of patient, constitute a preferred form of fixation during the first 10 days.
7. Further stabilization can be employed

through direct bonding if necessary, from 10 days to 4 weeks. After this time the tooth should be treated like any other tooth of similar developmental stage.

The subject of ligation and immobilization deserves special attention. It is important that mobility between healing parts be minimized in order to accelerate the cellular proliferation and reduce osteoclastic activity. Similarly, the transplant should be free from occlusal forces during this healing period.

8. The chance of favourable prognosis for a properly prepared autogenic dental transplant can approach 100%, provided the root shape is not grossly altered. The periodontal space should be of normal thickness and should completely circumscribe the tooth. It is expected that a normal lamina dura will form on the circumference of a successful transplant. Occlusal contacts should not be excessive and the tooth should maintain a normal eruptive potential. The tooth should not be unusually mobile.<sup>3,13-16</sup>

Given that the above mentioned care is excersized, the transplant has a good prognosis and should function like any other tooth in the arch.

## Conclusion

Under given conditions autotransplantation in combination with endodontic therapy is a viable alternative treatment option in the correction of single tooth malposition.

## References

1. Graber T M. Orthodontics – Principles and Practice, 3<sup>rd</sup> Ed, 1988 ; Philadelphia, WB Saunders Co., pp 204.
2. Proffit WR.: Contemporary Orthodontics, 2<sup>nd</sup> Ed, 1992; St. Louis, C.V Mosby., pp 2.
3. Northway WM. Autogenic tooth transplantation The "State of the Art" Am. J. Orthod - Dentofac Orthop. 1997; pp 146 – 162.
4. Paulsen HU and Andreasen. Pulp and periodontal

healing, root development and root resorption subsequent to transplantation and orthodontic rotation – In long term study of autotransplanted premolars. *Am. J. Orthod Dentofac Orthop.* 1997 ; pp 630 – 40.

5. Kristerson L. Autotransplantation of human premolars – A clinical and radiographic study of 100 teeth. *Int. J. Oral Surg.* 1985 ; 14 : 200 – 213.

6. Andreassen J.O., Hjorting –Hansen & Jolsto. A clinical and radiographic study of 76 autotransplanted third molars. *Scand. J. Dent. Res.* 1970 ; 78 : 512 – 523.

7. Hansen J and Fibaek B.: Clinical experience of auto- and allotransplantation of teeth. *Int. Dent. J.* 1972 ; 22 : 270 – 285.

8. Schwartz O, Bergman P, and Klausen B. Resorption of autotransplanted teeth. A retrospective study of 291 transplantations over a period of 25 years. *Int. J. Endod.* 1985 ; 20 : 14 – 18.

9. Altonen M, Haavikko K and Malmstrom M. Evaluation of autotransplantations of completely developed maxillary

canines. *Int. J. Oral Surg.* 1978 ; 7 : 434 – 441.

10. Gardiner GT. The autogenous transplantation of maxillary canine teeth. A review of 100 consecutive cases. *Br. Dent. J.* 1979 ; 146 : 382 – 385.

11. Hasselgren G, Larsson A, and Rundquist L. Pulpal status after autogenous transplantation of fully developed maxillary canines. *Oral Surg.* 1977 ; 44 : 106 – 112.

12. Moss JP. Autogenous transplantation of maxillary canines. *J. Oral Surg.* 1968 ; 26 : 775 – 783.

13. Nordenram A. and Bergman G. Autotransplantation of teeth. *Br. J. Oral Surg.* 1969 ; 7 : 188 – 195.

14. Boyne PJ. Tooth transplantation procedures utilizing bone graft materials. *J. Oral Surg.* 1961 ; 9 : 1 – 6, 47 – 53.

15. Cook RM. The current status of autogenous transplantation as applied to the maxillary canines. *Int. Dent. J.* 1972 ; 22 : 286 – 300.

16. Natiella JR. et al. The replantation and transplantation of teeth. *J. Oral Surg.* 1970 ; 29 : 397 – 419.